

XXV.—*Observations on Mr. Hancock's paper on the Excavating Sponges.* By JOHN MORRIS, F.G.S.

IN the interesting communication "On the Excavating powers of certain Sponges," &c. which appeared in the May Number of the 'Annals,' Mr. Hancock appears to have overlooked a paper published some time since by an Italian naturalist in which the same facts are fully and clearly described. Had this paper been more generally known, probably "the prevailing belief that *Cliona* does not excavate the chambers in which it is found, but that they are formed by worms or by decay," &c., might have been somewhat shaken, and "the matter which has remained up to the present time in obscurity" more clearly defined. It may therefore be interesting to some of the readers of this Journal to give a short abstract of what was previously known on this subject, not merely for advocating the priority of discovery, but as strengthening the opinion as to the excavating power of these bodies, so admirably illustrated by Mr. Hancock*.

Ten years have elapsed since Dr. Nardo communicated, in the name of his brother, to the Scientific Congress held at Pisa in 1839, a paper "On a new genus of Siliceous Sponges, named *Vioa*, living in excavations formed by itself in stones and in the shells of marine mollusca, boring them in every direction." This sponge consists of numerous small very fine acicular siliceous bodies arranged irregularly in a fleshy but not mucous substance, of a yellowish, orange or purple colour, permanent or fugacious according to the species. At certain periods of their growth, these sponges emit small germs visible to the naked eye, which transported by currents attach themselves to stones or marine shells, and commence to form passages in their substance, riddling them in every direction, so as even sometimes to destroy the stone or shell, leaving the sponge isolated and free. Dr. Nardo observed the following species all obtained from the Adriatic, and named by him *Vioa typus*, *coccinea*, *Clio*, *Pasithea*†.

At a subsequent meeting of the same Congress held at Milan in 1844, M. Michelin, whose attention had been previously directed to the point, read a short notice on the same subject, in which he alluded to the traces of an organized zoophytic body

* It is but justice to Mr. Hancock to state, that his description of the means by which these sponges perforate calcareous substances is both novel and interesting.

† Atti della prima riunione degli Scienziati Italiani tenuta in Pisa, 1839, p. 161; Pisa, 1840. A fuller notice of this paper is in the 'Annali delle Scien. del Reg. Lomb.-Venet.' vol. ix. p. 221; see also *Revue Zoologique*, 1840, p. 27. In the same journal (p. 343) is M. Duvernoy's description of *Spongia terebrans*, inhabiting the valves of *Ostrea hippopus*, Lam.

inhabiting the tubular and vesicular cavities in the shell of *Placuna sella*, but uncertain as to what family it really belonged. The Prince of Canino, President, appointed a commission, consisting of Drs. Rüppell and Nardo and Prof. Géné, to express their opinions on the fact, and Dr. Nardo in their name made a report, from which the following remarks are abridged.

The peculiarity described by M. Michelin consists in having noticed between the two faces of the superior valve of *Placuna sella*, on account of its transparency, a kind of arborescence with dichotomous and anastomosing branches, having the inferior branches thick and decreasing towards their extremities, which are generally sharp and forked.

On the inner layer of the shell no pores were observed communicating with the branches, but on the outer layer are numerous small perforations serially disposed and corresponding with the articulations. These cavities have been produced by a perforating parasitic animal which has introduced itself into the substance of the valve, and which in consequence of a greater resistance or hardness of the inner layer in contact with the animal of the *Placuna*, has been compelled to extend itself horizontally, so as to form the arborescence described. On some parts of the surface may be observed a few attempts at perforation which have been arrested by a new layer of solid matter. In the Milan city museum is a fine specimen of *Placuna* having both valves perforated. The large size of the holes in this shell has allowed a portion of the animal filling the cavities to be carefully examined. It belongs to the class of sponges, and specially to the genus *Vioa*, which Dr. Nardo first described in his memoir on the perforating sponges, published in the 'Annals of Science of the Lombardo-Venetian Kingdom*.' From the form and arrangement of the siliceous spiculæ, imbedded in the substance, sharp at one end and rounded at the other, it should be arranged (according to the system of Dr. Nardo) in the second order of siliceous sponges, the ninth family *Vioïdæ*, and the first subfamily *Vioïna*. This species appears to be distinct from all those previously known and described, and may therefore bear the name *Vioa Michelini*. Dr. Nardo further adds as an important fact, that it is not only the *Placunæ* which have been attacked by this kind of sponge, but also univalve shells; and mentions a large specimen of *Voluta* in the Milan museum, which is perforated by a species of sponge distinct from the *Vioa Michelini*, as regards its mode of development, which although serial and dendritic, has the vesicular and articulated cavities smaller and bored on both sides.

Dr. Nardo concludes the report with some remarks relative to

* See the volume previously quoted.

the genus *Vioa*, as well as to some inaccuracies of those authors who have written after him. He mentions that Dr. Johnston has not even suspected the *Halichondria cælata* (which is a *Vioa*) to be a perforating sponge; and also opposes the opinion of M. Dujardin, who thought that the perforations in shells and stones (which he, Dr. Nardo, had proved to be the work of a sponge) were at first occupied by small species of Annelides, and that the sponge subsequently inhabited their cavities. Dr. Nardo does not think that the name *Cliona* ought to be preferred to that of *Vioa* proposed by him, because Dr. Grant, in establishing his genus, did not consider it to be a sponge, but a polype having eight tentacula; and he consequently proposes that the *Spongia terebrans*, Duvernoy, which M. Dujardin regards as a *Cliona*, should be named *Vioa Dujardinii*, if however it is distinct from the species already described*.

Since the publication of this report for 1844, M. Michelin has observed a valve of *Meleagrina margaritifera*, Lam., and specimens of the genera *Conus* and *Fusus* perforated by species of *Vioa*, as well as a valve of the fossil, *Trigonia Dædalea*, Park. M. Michelin has also noticed traces of the same genus on fragments of fossil shells from the chalk of Orglandes and the supra-cretaceous beds of Grignon (*Revue Zoologique*, 1846).

The following species of *Vioa* appear to be identical with two of those described as *Cliona* by Mr. Hancock.

Vioa Nardina, Michelin, *Rev. Zool.* 1846, pl. 1. fig. 1.

V. dendritica, dichotoma, ramosissima, utriculis et tubulis composita; utriculis vel rotundis vel ellipticis in seriebus eleganter dispositis, inter se junctis per tubulos exiguos interne rugosos; tubulis terminalibus, acutissimis, sæpe furcatis.

Inhabits the upper valve of the *Placuna placenta*, Lam.

This species is identical with *Cliona Fryeri*, Hancock, *Ann. Nat. Hist.* 1849, p. 338. pl. 14. f. 2; and that author described it as imbedded in the same shell.

Vioa Michelini, Nardo, *Rev. Zool.* 1846, pl. 1. fig. 2.

V. dendritica, dichotoma, divaricata, utriculis et tubulis composita; utriculis numerosis, vesiculosus, subpolygonis, interne rugosis, vetriculis maximis, junioribus parvulis, elongatis, deinde subrotundis, per minutissimos tubulos junctis et anastomosantibus.

Inhabits the upper valve of *Placuna sella*, Lam.

This species is the same as the *Cliona spinosa*, Hancock, *Ann.*

* *Atti della sesta Riunione degli Scien. Ital. tenuta in Milano, 1844*, pp. 372, 428, and *Revue Zoologique*, 1846; see also *Annali delle Scien. del Reg. Lomb.-Ven.* 1845, p. 11.

Nat. Hist. 1849, p. 339. pl. 13. f. 5, and which he also found in the valves of *Placuna sella*.

At the Scientific Congress held at Lucca (1843), Dr. Nardo proposed a new classification of the *Spongiadae*, dividing them into five families, under the names of Corneo-spongia, Silico-spongia, Calci-spongia, Corneo-silici-spongia, Corneo-calci-spongia, these families containing thirty genera*.

XXVI.—On the Branchial Currents of the Bivalve Mollusca.

By JOSHUA ALDER, Esq.

To Richard Taylor, Esq.

DEAR SIR,

Newcastle-upon-Tyne, 16th August 1849.

IT was not my intention again to have troubled you concerning those points in the œconomy of the Bivalves about which Mr. Clark and I are at variance, but the concluding paragraph of that gentleman's letter, in which he claims to have set at rest the use of the anterior siphon in the genus *Kellia*, demands a few words from me, lest my silence should be taken as an acquiescence in such a statement. Perhaps I am also entitled to a reply to the two new arguments by which my opinions are attempted to be disproved.

Mr. Clark has at length given us a distinct statement of his views with respect to the admission of water into the branchial cavity of the bivalves, which he attributes to the opening and closing of the valves alone, and not to the action of cilia. Had this been stated at first, some misunderstanding might have been avoided. Undoubtedly a branchial current entering by a special aperture, whether anterior or posterior, cannot be accounted for by the opening and shutting of the valves. To explain such a current the existence of ciliary action is required; but I was unwilling to believe that a gentleman of Mr. Clark's information could entirely have discarded it. However, instead of arguing this point further, I shall take the liberty of giving the result of some observations made upon two or three species of bivalves since the publication of my last letter.

A small specimen of *Modiola vulgaris*, placed in a glass of sea-water, gradually expanded the margin of the mantle beyond the shell, and protruded the excretory siphon. When these were

* Atti della quinta unione degli Scien. Ital. tenuta in Lucca, 1843, p. 436. The details of this paper have not I believe been published; a short notice however of the three first families appeared about fifteen years ago in Dr. Oken's 'Isis.'